

Probiotics in pregnancy

Souza Mirella C. ¹, Santos Maria Gisele ^{2,*} and Kreider Richard B. ³

¹ Physical Education Department, Federal University of Paraná, Brazil.

² Physical Education Department, Texas A&M University, EUA.

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Abstract

Currently, the use of probiotics as well as prebiotics and symbiotics permeate the medical and lay literature. Although not all functions of probiotics are known yet, their role in maintaining human health is undeniable. Particularly during pregnancy, one of the greatest legacies that a pregnant woman can leave for the fetus and subsequent newborn is good microbiota. This article aims to bring the main implications of the maternal microbiome on child health.

Keywords: Probiotics; Prebiotics; Symbiotic; Pregnancy; Maternal microbiome.

1. Introduction

The importance of probiotics in pregnant women is undeniable, such as the production of vitamins K and B12, regulation of the immune system, and digestion of nutrients. But not all components of the gut microbiome are good for human health. When good habits such as doing exercises and eating healthy foods are established, a functional microbiome is a result. Otherwise, when sedentarism, being overweight, and eating nonhealthy food are present, dysbiosis may occur. When dysbiosis occurs during pregnancy, the outcomes can be dangerous for the pregnant and for the infant. If this dysbiosis occurs in neonatal preterm infants, the risk rises for disease as necrotizing enterocolitis and sepsis. The risk of dysbiosis is associated with the risk of chronic degenerative diseases and compromises not only the future of the individual but also of an entire society.

2. Importance of probiotics in pregnant women

Currently, the use of probiotics as well as prebiotics and symbiotics permeate the medical and lay literature. But knowledge about microorganisms began with microscopy in 1665 when Robert Hooke and Antoni Van Leeuwenhoek began to describe the taxonomy of beings that were totally unknown until then.

Decades later, culture methods began to be implemented, expanding the knowledge of microorganisms. But it was soon realized that through culture it would not be possible to recognize more than 30% of the whole research. Since then, the evolution of research on microorganisms has taken a similar focus to that of the genome, and today the microbiome is at the height of scientific interest. Today the microbiome tries to understand how the RNA, DNA and metabolites of microorganisms act in the human body. (1)

Humans have 1 to 2 kg of intestinal microbiota. The gut microbiome consists of a community of 10^{14} bacterial comprising thousand different species. This number is greater than that of our cells, and the entire genome of these

* Corresponding author: Mirella Cristiane de Souza
Federal University of Paraná, Federal University of Paraná, Brazil.

beings together has 100 times more genes than the human genome. Today, the pun is already being used: do germs inhabit us, or do we inhabit germs? (2)

Within the human microbiota, there are germs that cohabit in harmony and help us perform basic functions such as the production of vitamins K and B12, regulation of the immune system, and digestion of nutrients. However, within the same microbiota, there are germs that compete for human energy sources and are potentially harmful to health.

With westernization and all the problems that permeate it such as a sedentary lifestyle and poor diet, the health of the microbiota and consequently human health has been at risk. A decompensated diet combined with a lack of physical exercise gives more chances to dysbiosis, which is the increase in pathogenic germs. If this dysbiosis occurs in neonatal preterm infants, the risk rises for disease as necrotizing enterocolitis and sepsis. (3)

Particularly during pregnancy, one of the greatest legacies that a pregnant woman can leave for the fetus and subsequent newborn is good microbiota. Until recently, the uterus was believed to be a sterile place from the point of view of microorganisms. Therefore, the impact of dietary errors and maternal overweight was not in vogue when the subject was the pregnant woman's microbiota. But with the studies by JIMENEZ et al. (2005), identifying microorganisms in the umbilical cord, placenta and vaginal canal, this concept fell apart. Studies have proven that what was known until then was wrong. The passage of the microbiome is not horizontal as thought, but vertical. This means that the baby acquires its first microorganisms during pregnancy. (1)

Every healthy adult female has a level of Bifidobacterium to pass through to offspring. With each new offspring, a new legacy. And this legacy had been well passed on until the advent of cultural westernization. With the increase in malnutrition and sedentary lifestyle, the number of obese and overweight pregnant women has increased. The newborn of overweight women has a lower concentration of Bifidobacterial and a higher concentration of pathogenic microorganisms. The question that does not want to be silent nowadays is: what are we going to leave for future offspring? An absence of microbiota or a diseased microbiota? And the next question would be how to reverse this imminent threat of generational dysbiosis.

The path to healthy microbiota starts with an adequate maternal diet and maintaining weight within the stipulated healthy BMI. The next step is, whenever possible, vaginal delivery at term. And, following the premises of the thousand days, exclusively breastfeed the baby for up to 6 months and partial up to two years. In addition to breastfeeding, the introduction of a healthy diet for up to two years. However, the path we are following is the opposite path of the postulate for good microbiota (4)

When it comes to nutrition in pregnant women, a cross-sectional study carried out between 2015 and 2016 showed that at the end of the third trimester, 61.1% of Brazilian pregnant women were overweight and 15% were already obese. In this same study, the most impressive was to identify that 93.7% of the prenatal care cards did not even have the BMI marking. This becomes worrying when knowing the concept of metabolic crosstalk: obese pregnant women have a lower number of Bifidobacterium. And the high number of Bifidobacterium in the first month of life was inversely correlated with the presence of obesity at seven years of age. Therefore, a starting risk factor for obesity this baby already receives in its genesis.

The second step of a healthy microbiota is also shown to be compromised in Brazil. Unlike several countries in the world, Brazil has a high number of cesarean sections. In 2019, Brazil ranked second in the world for cesarean sections, maintaining an average of 56,3% of deliveries while the world average is 15%. (5). Brazil also fails to breastfeed, with only 36% of children able to be breastfed for up to 6 months. And to complete the dysbiosis process, the early introduction of fatty, sugary, and ultra-processed foods in childhood is added.

The risk of dysbiosis is associated with the risk of chronic degenerative diseases such as inflammatory bowel disease, atopic disease, overweight, and diabetes mellitus. Dysbiosis caused by being overweight in pregnancy and inadequate nutrition of children compromises not only the future of the individual but also of an entire society.

With the immediate pattern of the contemporary population, it is soon thought that it is enough to supplement pregnant women and children with lactobacilli and everything will be solved. Unfortunately, this is not what studies have been able to prove so far. Lactobacilli supplementation in pregnant women today brings more questions than answers. It is not known if all can make use of it. If they could, which strains would be best, in what quantity, and for how long. Today, the World Allergy Organization was the only one to pronounce for which situations supplementation would be indicated: pregnant women at high risk of having an atopic child, women who breastfeed children at high risk of atopy, and children at high risk of developing an allergy. (6)

3. Conclusion

Therefore, it is extremely important that the pregnant woman understands that prevention is the only way out and that the lactobacillus does not have the role of replacing good nutrition, exercise, and a healthy lifestyle.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest.

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